

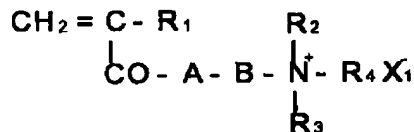
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Application No. 10/517,011
Filed: July 7, 2005
TC Art Unit: 1731
Confirmation No.: 2774

AMENDMENT TO THE CLAIMS

1. (CANCELLED)

2. (CURRENTLY AMENDED) A water-soluble polymer dispersion ~~according to Claim 1, wherein the~~ in which a water-soluble polymer having at least one type of ionicity selected from among said cationicity and said-amphotericity and occurring in the form of fine particles with a particle size of not greater than 100 μ m and a polyalkylenimine in the sulfate salt form coexist, wherein the polymer is produced by dispersion polymerization of a monomer (or monomer mixture) comprising 5 to 100 mole percent of a monomer represented by the general formula (1) and/or (2) given below, 0 to 50 mole percent of a monomer represented by the general formula (3) given below and 0 to 95 mole percent of a water-soluble nonionic monomer with stirring in the presence of said polyalkylenimine and/or modified polyalkylenimine in the sulfate salt form, if necessary further in the presence of a necessary amount of a water soluble inorganic salt.



General formula (1)

(In the general formula (1), R_1 is a hydrogen atom or a methyl group, R_2 and R_3 may be the same or different and each is an alkyl or an alkoxy group containing 1 to 3 carbon atoms or a benzyl group, R_4 is a hydrogen atom, an alkyl or alkoxy group containing

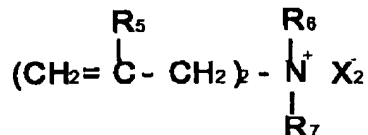
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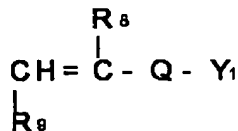
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1 to 3 carbon atoms or a benzyl group. A represents an oxygen atom or NH, B represents an alkylene or an alkoxy group containing 2 to 4 carbon atoms, and X₁ represents an sulfate anion.)



General formula (2)

(In the general formula (2), R₅ represents a hydrogen atom or a methyl group, R₆ and R₇ each represents an alkyl or an alkoxy group containing 1 to 3 carbon atoms or a benzyl group, and X₂ represents an sulfate anion.)



General formula (3)

(In the general formula (3), R₈ represents a hydrogen atom, a methyl group or a carboxymethyl group, Q represents SO₃, C₆H₄SO₃, CONHC(CH₃)₂CH₂SO₃, C₆H₄COO or COO, R₉ represents a hydrogen atom or COOY₂, and Y₁ or Y₂ represents a hydrogen atom or a cation.)

3. (CURRENTLY AMENDED) A water-soluble polymer dispersion ~~according to Claim 1, wherein the~~ in which a water-soluble polymer having at least one type of ionicity selected from among said anionicity and said nonionicity and occurring in the form of fine particles with a particle size of not greater than 100 μm and a

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polyalkylenimine in the sulfate salt form coexist, wherein the polymer is produced by dispersion polymerization of a monomer composition (mixture) comprising at least one monomer selected from among monomers represented by said general formula (3) given above and water-soluble nonionic monomers in the presence of said polyalkylenimine and/or modified polyalkylenimine in the sulfate salt form, if necessary further in the presence of a necessary amount of a water soluble inorganic salt.

4-6. (CANCELLED)

7. (CURRENTLY AMENDED) A water-soluble polymer dispersion in which a water-soluble polymer having at least one type of ionicity selected from among cationicity, an amphotericity, a nonionicity and an anionicity and occurring as fine particles with a particle size of not greater than 100 μ m and a polyalkylenimine in the sulfate salt form coexist,

~~according to Claim 1,~~ wherein the polyalkylenimine is polyethylenimine.

8. (CURRENTLY AMENDED) A water-soluble polymer dispersion in which a water-soluble polymer having at least one type of ionicity selected from among cationicity, an amphotericity, a nonionicity and an anionicity and occurring as fine particles with a particle size of not greater than 100 μ m and a polyalkylenimine in the sulfate salt form coexist,

wherein the polyalkylenimine ~~and/or modified polyalkylenimine~~ amounts to 20 to 200% by mass relative to the water-soluble ~~polymer having at least one type of ionicity selected from among~~

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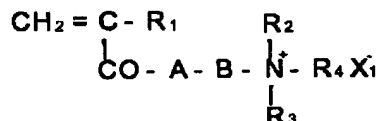
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~~said cationicity, said amphotericity, said nonionicity and said anionicity.~~

9. (CURRENTLY AMENDED) A method of producing water-soluble polymer dispersions, wherein a dispersion of fine particles of a polymer having at least one type of ionicity selected from among cationicity and amphotericity is produced by subjecting a monomer (or monomer mixture) comprising 5 to 100 mole percent of a monomer represented by the general formula (1) and/or (2) given below, 0 to 50 mole percent of a monomer represented by the general formula (3) given below and 0 to 95 mole percent of a water-soluble nonionic monomer to dispersion polymerization with stirring in the presence of a polyalkylenimine ~~and/or a modified polyalkylenimine~~ in the sulfate salt form, ~~if necessary further in the presence of a necessary amount of a water soluble inorganic salt.~~



General formula (1)

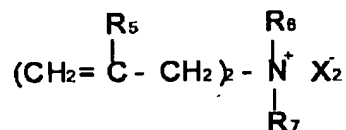
(In the general formula (1), R₁ is a hydrogen atom or a methyl group, R₂ and R₃ may be the same or different and each is an alkyl or alkoxy group containing 1 to 3 carbon atoms or a benzyl group, R₄ is a hydrogen atom, an alkyl or alkoxy group containing 1 to 3 carbon atoms or a benzyl group. A represents an oxygen atom or NH, B represents an alkylene or alkoxy group containing 2 to 4 carbon atoms, and X₁ represents an sulfate anion.)

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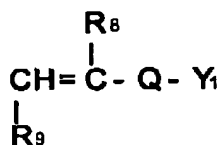
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General formula (2)

(In the general formula (2), R₅ represents a hydrogen atom or a methyl group, R₆ and R₇ each represents an alkyl or alkoxy group containing 1 to 3 carbon atoms or a benzyl group, and X₂ represents an sulfate anion.)



General formula (3)

(In the general formula (3), R₈ represents a hydrogen atom, a methyl group or a carboxymethyl group, Q represents SO₃, C₆H₄SO₃, CONHC(CH₃)₂CH₂SO₃, C₆H₄COO or COO, R₉ represents a hydrogen atom or COOY₂, and Y₁ or Y₂ represents a hydrogen atom or a cation.)

10. (CURRENTLY AMENDED) A method of producing water-soluble polymer dispersions, wherein a dispersion of fine particles of a polymer having at least one type of ionicity selected from among anionicity and nonionicity is produced by subjecting a monomer composition (mixture) comprising at least one monomer selected from among monomers represented by the general formula (3) given below and water-soluble nonionic monomers to dispersion polymerization with stirring in the presence of a polyalkylenimine

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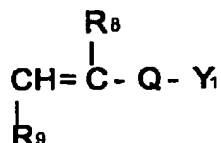
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~~and/or a modified polyalkylenimine in the sulfate salt form, if necessary further in the presence of a necessary amount of a water soluble inorganic salt.~~



General formula (3)

(In the general formula (3), R_8 represents a hydrogen atom, a methyl group or a carboxymethyl group, Q represents SO_3 , $C_6H_4SO_3$, $CONHC(CH_3)_2CH_2SO_3$, C_6H_4COO or COO , R_9 represents a hydrogen atom or $COOY_2$, and Y_1 or Y_2 represents a hydrogen atom or a cation.)

11. (CURRENTLY AMENDED) A method use of using the water-soluble polymer dispersion according to any of Claims 1-2, 3, 7, ~~to~~ 8, 23, 27, 31 and 33 ~~to~~ 35, wherein the water-soluble polymer dispersion is added to paper stuff-making raw material before papermaking for pretreatment thereof.

12. (CURRENTLY AMENDED) A method use of using the water-soluble polymer dispersion according to any of Claims 1-2, 3, 7, ~~to~~ 8, 23, 27, 31 and 33 ~~to~~ 35, wherein the water-soluble polymer dispersion is added to paper stuff-making raw material before papermaking to thereby improve the freeness thereof.

13. (CURRENTLY AMENDED) A method use of using the water-soluble polymer dispersion according to any of Claims 1-2, 3, 7, ~~to~~ 8, 23, 27, 31 and 33 ~~to~~ 35, wherein the water-soluble polymer dispersion is added to paper stuff-making raw material before papermaking, in

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which a sizing agent coexists, to thereby improve the degree of sizing.

14. (CURRENTLY AMENDED) A method use of ~~using~~ the water-soluble polymer dispersion according to any of Claims ~~1-2~~, 3, 7, ~~to~~ 8, 23, 27, 31 and 33-~~to~~ 35, wherein the water-soluble polymer dispersion is added to paper-stuff making raw material before papermaking to thereby improve the yield, followed by papermaking.

15. (CURRENTLY AMENDED) A method use of ~~using~~ the water-soluble polymer dispersion according to any of Claims ~~1-2~~, 3, 7, ~~to~~ 8, 23, 27, 31 and 33-~~to~~ 35, wherein the water-soluble polymer dispersion is added to paper-stuff making raw material before papermaking in combination with an inorganic and/or organic anionic substance to thereby improve the yield, followed by papermaking.

16. (CURRENTLY AMENDED) A method use of ~~using~~ the water-soluble polymer dispersion according to any of Claims ~~1-2~~, 3, 7, ~~to~~ 8, 23, 27, 31 and 33-~~to~~ 35, wherein the water-soluble polymer dispersion is added to organic sludge or paper mill-derived sludge to cause flocculation, followed by dewatering by means of dewatering equipment.

17. (CURRENTLY AMENDED) A method use of ~~using~~ the water-soluble polymer dispersion according to any of Claims ~~1-2~~, 3, 7, ~~to~~ 8, 23, 27, 31 and 33-~~to~~ 35, wherein the water-soluble polymer dispersion is added to organic sludge or paper mill-derived sludge in combination with an amphoteric or anionic water-soluble polymer to

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cause flocculation, followed by dewatering by means of dewatering equipment.

18-22. (CANCELLED)

23. (PREVIOUSLY PRESENTED) A water-soluble polymer dispersion according to Claim 2, wherein the polyalkylenimine is polyethylenimine.

24-26. (CANCELLED)

27. (CURRENTLY AMENDED) A water-soluble polymer dispersion according to Claim 2, wherein the polyalkylenimine ~~and/or modified polyalkylenimine~~ amounts to 20 to 200% by mass relative to the water-soluble polymer ~~having at least one type of ionicity selected from among said cationicity, and said amphotericity, said nonionicity and said anionicity.~~

28-30. (CANCELLED)

31. (CURRENTLY AMENDED) A water-soluble polymer dispersion according to Claim 7, wherein the polyalkylenimine ~~and/or modified polyalkylenimine~~ amounts to 20 to 200% by mass relative to the water-soluble polymer ~~having at least one type of ionicity selected from among said cationicity, said amphotericity, said nonionicity and said anionicity.~~

32-34. (CANCELLED)

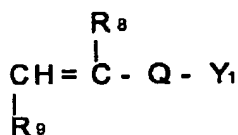
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35. (CURRENTLY AMENDED) A water-soluble polymer dispersion according to Claim 31, wherein the water-soluble polymer ~~having at least one type of ionicity selected from among said anionicity and said nonionicity and occurring in the form of fine particles is~~ produced by dispersion polymerization of a monomer composition (mixture) comprising at least one monomer selected from among monomers represented by said general formula (3) given ~~above~~ below and water-soluble nonionic monomers in the presence of said polyalkylenimine ~~and/or modified polyalkylenimine in the sulfate salt form, if necessary further in the presence of a necessary amount of a water soluble inorganic salt.~~



General formula (3)

(In the general formula (3), R_8 represents a hydrogen atom, a methyl group or a carboxymethyl group, Q represents SO_3 , $C_6H_4SO_3$, $CONHC(CH_3)_2CH_2SO_3$, C_6H_4COO or COO , R_9 represents a hydrogen atom or $COOY_2$, and Y_1 or Y_2 represents a hydrogen atom or a cation.)